

# Ground Surface Deformation of L'Aquila Earthquake Revealed by InSAR Time Series

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## SUMMARY

We measured deformation field and its evolution processes of the Mw 6.3 L'Aquila earthquake occurred on 6 April 2009, using time series of ASAR ascending track images acquired from October 2008 to September 2009. We processed the time series using the Stanford method for persistent scatterers. On epicenter the significant deformations was observed: (1) Envisat ASAR satellite detected clearly the process of the displacement field change of the earthquake and the different deformation characteristics associated with focal rupture in different period, which included pro-earthquake creep displacement, obvious accelerating deformation, rapid rupture during the quake, and continuously and significantly decreased deformation in magnitude after the quake. (2) There existed a significant accumulation of regional stress and strain the period of the seismogenic zone become destabilizing before the seismogenic fault ruptured and dislocated. (3) The region of the strongest deformation and ground rupture located at a low depression area tending towards southeast. The cracking propagated with an orientation of  $135^\circ$ , along the NW striking and SW dipping Paganica-S. Demetrio normal fault. (4) The rupture was mainly formed at the epoch of earthquake and thereafter with a maximum subsidence of 210 mm in the line-of-sight, concentrating on a zone of 22 km x 14 km, and a large subsidence bowl was formed.